

Appl. No. 09/649,528

Amdt. Dated 18 March 2005

Reply to Office action of 17 February 2005

AMENDMENTS TO THE CLAIMS

Please substitute the following claims for the respective claims previously existing in this application.

1. (Currently amended) A hydrogen generator comprising:

an inlet channel;

a vaporization zone receiving liquid fuel from the inlet channel;

a reaction zone including a reforming catalyst;

at least one vapor channel for transporting a vapor from the vaporization zone to the reaction zone;

an outlet channel for transporting hydrogen enriched gas out of the reaction zone;

a chemical heater receiving fuel from the inlet channel and thermally coupled to the reaction zone and vaporization zone using thermally conductive channels or thermally conductive vias, the chemical heater including:

an air inlet for receiving oxygen for oxidation of the fuel to produce heat; and

a catalyst; and

the inlet channel, the vaporization zone, the reaction zone, the chemical heater, the at least one vapor channel, and the outlet channel all comprising a fuel processor and all formed within an integral, sintered, monolithic ceramic carrier.

2-7. (Cancelled).

8. (Previously presented) A hydrogen generator as claimed in claim 1 wherein one of the vaporization zone and the reaction zone include a plurality of parallel channels.

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9. (Cancelled).

10. (Previously presented) A hydrogen generator as claimed in claim 1 wherein the integral, sintered, monolithic ceramic carrier is a monolithic three-dimensional multilayer ceramic structure.

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11. (Currently amended) A hydrogen generator comprising:

a three-dimensional integral, sintered, monolithic multilayer ceramic carrier structure defining a fuel processor including a vaporization zone and a reaction zone including a reforming catalyst, at least one of the vaporization zone and the reaction zone including one of a plurality of parallel channels or at least one serpentine channel formed in the integral, sintered, monolithic multilayer ceramic carrier structure for transporting a liquid fuel to the vaporization zone and for transporting a vapor in the reaction zone, the integral, sintered, monolithic ceramic carrier structure further including one of a resistive heater that is electrically driven or a chemical heater including a catalyst and arranged to oxidize fuel to produce heat, the resistive heater or the chemical heater ~~an integrated heater~~ thermally coupled to the reaction zone and the vaporization zone using thermally conductive channels or thermally conductive vias;

an inlet channel for introducing liquid fuel into the fuel processor;

wherein the chemical heater receives fuel from the inlet channel and includes an air port for receiving oxygen for the oxidation of the fuel;

an outlet channel for transporting hydrogen enriched gas out of the fuel processor; and

the vaporization zone, the reaction zone, the one of a resistive heater or chemical heater, the inlet channel, and the outlet channel also formed within the integral, sintered, monolithic ceramic carrier.

12-15. (Cancelled).

16. (Previously presented) A hydrogen generator as claimed in claim 11 wherein one of the vaporization zone and the reaction zone include a plurality of parallel channels.

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17. (Cancelled).

18. (Currently amended) A hydrogen generator comprising:

a three-dimensional, integral, sintered, monolithic multilayer ceramic carrier structure defining a fuel processor including a vaporization zone and a reaction zone including a reforming catalyst, at least one of the vaporization zone and the reaction zone including one of a plurality of parallel channels or at least one serpentine channel, the three-dimensional, integral, sintered, monolithic ceramic carrier structure further including one of a resistive heater that is electrically driven or a chemical heater including a catalyst and arranged to oxidize fuel to produce heat ~~an integrated heater~~ thermally coupled to the reaction zone and the vaporization zone using thermally conductive structures;

~~an inlet channel for introducing liquid fuel into the fuel processor;~~

wherein the optional chemical heater includes an air port for providing oxygen for the oxidation of the fuel and an inlet channel having an opening to provide fuel to the chemical heater;

an outlet channel for transporting hydrogen enriched gas out of the fuel processor; and

the vaporization zone, the reaction zone, one of a resistive heater or a chemical heater, the one of a plurality of parallel channels or at least one serpentine channel, the inlet channel, and the outlet channel also formed within the integral, sintered, monolithic ceramic carrier.

19-21. (Cancelled).